

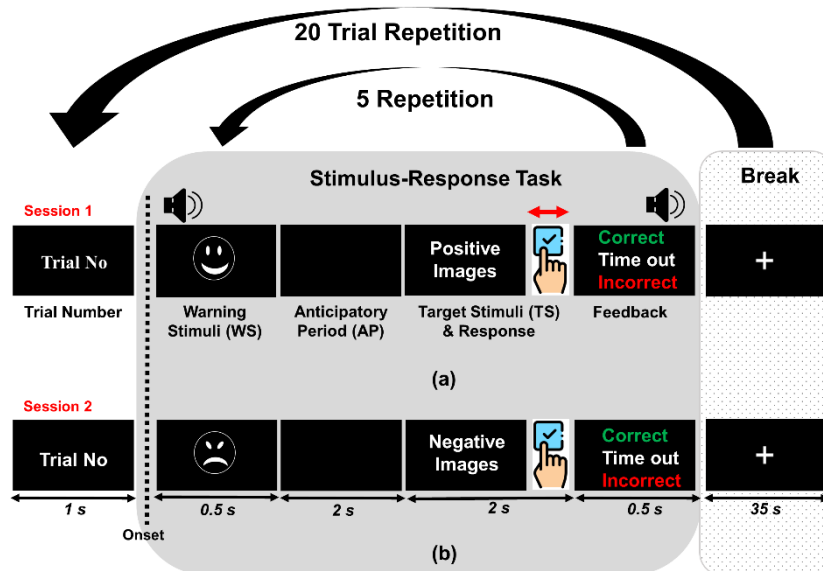
# Biomarker of Lateralization Index for Stress Calculated from Hemodynamic Responses of fNIRS for Subdividing between Eustress and Distress

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Citation: It will be updated soon. Please contact admin.

## Experimental paradigm

These experiments designed two separate sessions comprising 20 trials with respect to each task. Smile or non-smile (S1) was presented (one at a time) on the display monitor for 0.5 s with an anticipatory period (AP) of 2 s. At the end of the AP, positive or negative images (S2) were presented in a semi-random order in the center of computer monitor for 2 s and participants should find a positive or negative target, depending on the conditions of each session. Each session is as follows. (a) positive stimulus-positive target, (b) negative stimulus-negative target. If participants find the target image, they should press the right key; otherwise, they should press the left key. It is important to note that participants should press the button as quickly as possible for reaction time analysis. Each session was counterbalanced across participants. In order to enhance participants' motivation for efficient task-performance, feedback results (i.e., correct, incorrect, or time out) was presented automatically after each stimulus. Then, an inter-trial break period was showed with a cross fixation for 35 s. **Figure 1** shows the experimental block design.



**Figure 1** Experiment block design. There is a total of 20 trials for each of the conditions (a) Negative focus: smile (stimulus) and positive image (target) and (b) Positive focus: un-smile (stimulus) and negative image (target). In each block, experimental task is presented for 25s followed by 35s rest. Note that triggers were transmitted and marked in the data file from the

start of the task periods to the end (e.g, Session 1: 1~11; Session 2: 2~22) during one trial for each session. The inter-trial interval (i.e., the time interval between adjacent triggers) was 60 s on average.

### Data recording

The fNIRS data were recorded by a two-wavelength(780-850nm) continuous-time multi-channel fNIRS system (NIRSIT Lite, OBELAB, Seoul, Korea) consisting of 15 light channels. Each channel was placed on prefrontal cortex (PFC) around forehead, where Figure 2 depicts the placement of the fNIRS optodes. Five sources were placed on positions green circles, whereas seven detectors were placed on yellow circles. Emitter-detector distance was 25 mm for contiguous optodes and were attached to the forehead. The center of the middle probe set row was placed approximately at FPz, according to the 10-20 international system.

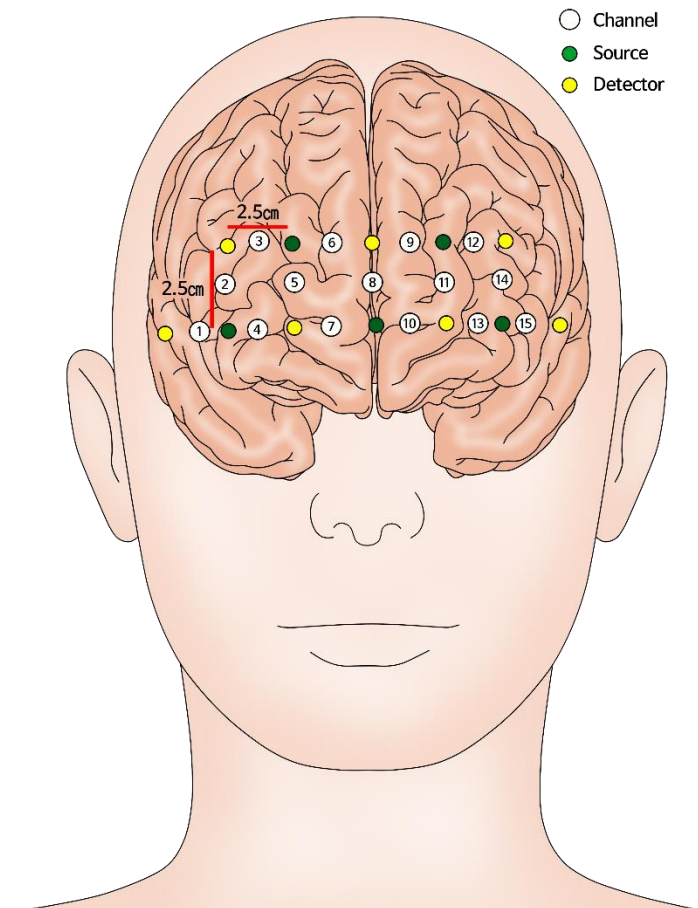


Figure 2 The topographical distribution of the fNIRS recording channels